

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

| | | | |
|--|---|---|-----------------------|
| Applicant's or agent's file reference FP04-0153-00 | FOR FURTHER ACTION | | See Form PCT/IPEA/416 |
| International application No. PCT/JP2004/010171 | International filing date (day/month/year) 09.07.2004 | Priority date (day/month/year) 11.07.2003 | |
| International Patent Classification (IPC) or national classification and IPC G06T1/00 G06T7/00 | | | |

Applicant

TOYOTA JIDOSHA KABUSHIKI KAISHA

| |
|--|
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input checked="" type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p> |
|--|

| | |
|---|-----------------------------------|
| Date of submission of the demand | Date of completion of this report |
| Name and mailing address of the IPEA/JP | Authorized officer |
| Facsimile No. | Telephone No. |

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/010171

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language _____ which is the language of a translation furnished for the purposes of:

international search (Rule 12.3 and 23.1(b))
 publication of the international application (Rule 12.4)
 international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

the international application as originally filed/furnished
 the description:
 pages _____ as originally filed/furnished
 pages* _____ received by this Authority on _____
 pages* _____ received by this Authority on _____

the claims:
 nos. _____ as originally filed/furnished
 nos.* _____ as amended (together with any statement) under Article 19
 nos.* _____ received by this Authority on _____
 nos.* _____ received by this Authority on _____

the drawings:
 sheets _____ as originally filed/furnished
 sheets* _____ received by this Authority on _____
 sheets* _____ received by this Authority on _____

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. The amendments have resulted in the cancellation of:

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (specify): _____
 any table(s) related to sequence listing (specify): _____

4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (specify): _____
 any table(s) related to sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/010171

Box No. IV Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:
 - restricted the claims.
 - paid additional fees.
 - paid additional fees under protest.
 - neither restricted the claims nor paid additional fees.
2. This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
 - complied with.
 - not complied with for the following reasons:

The inventions set forth in claims 1-22 provide means for extracting observation vectors from the frames of a moving image, and a three-dimensional model initialisation means with a movement estimation means, in order to estimate the movement of a set feature point on a three-dimensional object from a moving image of said three-dimensional object captured with a monocular camera.

In the inventions set forth in claims 23-26, 30-33, 37 and 39, a face is imaged with a monocular camera and in order to find the line of sight from the captured moving image, the three-dimensional structure of the pupil centres in the image of the face is defined by a static parameter and dynamic parameter, and the line of sight is found by estimating the static parameter and dynamic parameter.

[continued in the supplementary box]

4. Consequently, this report has been established in respect of the following parts of the international application:

- all parts.
- the parts relating to claims Nos. _____

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

| | |
|-------------------------------|-------------------|
| International application No. | PCT/JP2004/010171 |
|-------------------------------|-------------------|

| | |
|-----------|---|
| Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
|-----------|---|

1. Statement

| | | |
|-------------------------------|--------------|-----|
| Novelty (N) | Claims 1-22 | YES |
| | Claims 23-40 | NO |
| Inventive step (IS) | Claims 1-22 | YES |
| | Claims 23-40 | NO |
| Industrial applicability (IA) | Claims 1-40 | YES |
| | Claims _____ | NO |

2. Citations and explanations (Rule 70.7)

Document 1: JP 11-281323 A (Isuzu Motor Co., Ltd.)

Document 2: JP 11-281324 A (Isuzu Motor Co., Ltd.)

Claims 23-40

Documents 1 and 2 disclose finding a designated absolute position and eyeball direction, and adding to this the angle and the position of the head, to calculate the direction of line of sight.

Since the "reference mark (and eyeball position, which has a fixed positional relationship relative to the reference mark)" in documents 1 and 2 is positioned statically relative to the face, it is equivalent to a "static parameter" and a "rigid parameter" in the present application.

Similarly, since the "eyeball direction" in documents 1 and 2 is a dynamically changing parameter, it is equivalent to a "dynamic parameter" and a "non-rigid parameter" in the present application.

Therefore, the inventions set forth in the aforementioned claims in the present application are not novel and do not involve an inventive step.

The inventions set forth in claims 1-22 are not

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/010171

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

disclosed in any of the documents cited in the international search report, and are not obvious to a person skilled in the art.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/010171

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

IV. 3

In the inventions set forth in claims 27-29, 34-36, 38 and 40, a three-dimensional object is imaged with a monocular camera, and in order to find the movement of a three-dimensional object from the captured moving image, the three-dimensional structure of the three-dimensional object in the image is defined by a rigid parameter and a non-rigid parameter, and three-dimensional movement is found by estimating the rigid parameter and non-rigid parameter